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# A NEW SPECIES OF WYEOMYIA FROM THE PITCHER PLANT (Diptera, Culicidae)

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Forty years ago, Mitchell (1) found a few *Wyeomyia* larvae in the leaves of *Sarracenia purpuraea* in the Botanical Gardens of Washington, D. C. These plants had been brought from South Carolina a few years earlier. This author observed a small pair of upper anal gills, and remarked: "Having read the descriptions of *Wyeomyia smithii*, it did not seem logical for that species to have but two anal gills, when all other mosquito larvae had four, or the rudiments of them. Having examined alcoholic specimens to see if at least traces of the other gills were not present, I failed to find any. The specimens being in poor condition, however, I was not satisfied, but desired to examine living specimens. . . ." Then, after examining the above-mentioned specimens: "The published descriptions had probably been made from alcoholic specimens, where the gills are extremely hard to find, even when known to be present, as they shrink between the larger two and it is necessary to remove one of the latter in order to see the smaller gills plainly."

Mitchell was actually comparing two different kinds of larvae. Subsequent authors have not reviewed the disparity of the anal gills between northern and southern specimens of pitcher plant *Wyeomyia* larvae. The writer has examined presumably typical *smithii* larvae from New Jersey, New York, Ontario and Wisconsin, and in no case can a second pair of anal gills be demonstrated. On the other hand, larvae from several localities in North and South Carolina have been examined and found to be similar to each other and to differ from *smithii* by several characters, notably by the presence of a pair of small upper gills, which are as easily observed in preserved or mounted larvae as they are in living larvae. On the basis primarily of larval characters the Carolina form is here described as a new species.

*The writer is indebted to personnel of the South Carolina State Board of Health for their generous assistance in obtaining material for this study.

**Wyeomyia haynei**, new species

*Wyeomyia smithii* in part Mitchell, not Coquillett.

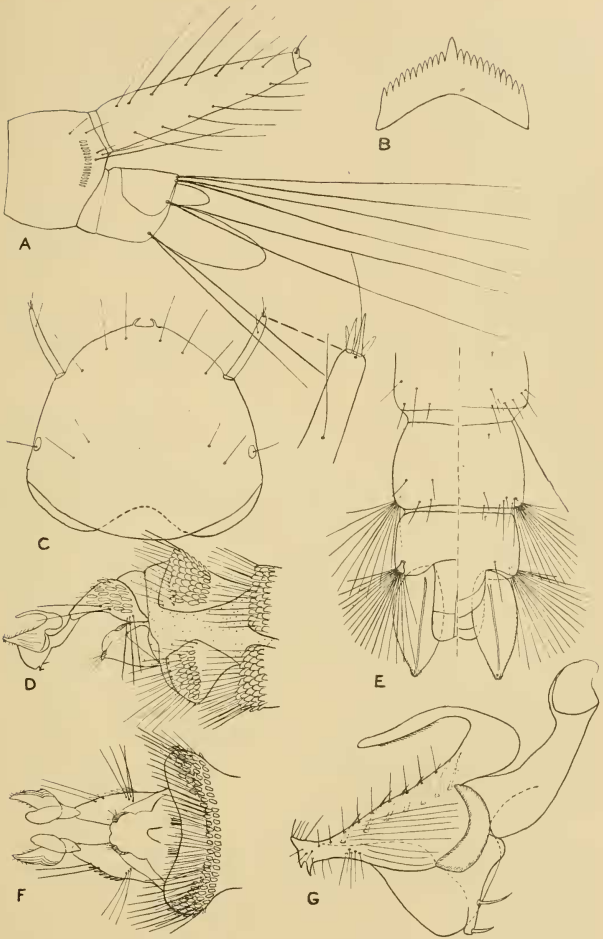
*Wyeomyia smithii* (2) Carpenter, Middelkauff and Chamberlain, 1946, pp. 93-96, Figs. 47 and 48.

HOLOTYPE MALE. Abdomen 1.8 mm. long; wing 2.57 mm. long, .57 mm. wide; proboscis 1.9 mm. long; palpus .1 mm. long. Proboscis long, slender; palpi very short; antennae less than two thirds as long as the proboscis, each segment with a whorl of about ten moderately long hairs; torus not scaled, with a velvety grey appearance; occiput with broad, appressed scales only. Mesonotum with broad, appressed scales, of which the majority are directed postero-laterally; wings uniformly dark-scaled, the scales absent on the cross veins, the base of Rs and the apex of the anal vein. Legs with lengths of segments as given in Table I; tarsal claws minute, except the outer claw of the middle leg, which is long and strongly hooked.

Vestiture of body of broad, appressed scales, absent on the antennae, clypeus, frons, postnotum and posterior part of scutellum, also with nude areas on the sides of the thorax. Bristles dark, confined to the margins of the terminal abdominal segments, a small group on the postnotum, a marginal fringe on the mesonotum from the region of the anterior spiracles posteriorly around the scutellum, a few on the anterior margin of the mesonotum, a row on the anterior margin of the pronotal lobes, a few groups of small bristles on the sides of the thorax, and a postocular row of bristles, of which the dorsal submedian pair is much the largest. The legs bear small bristles, some of which are concealed among the scales. The tergite of the first abdominal segment bears long, fine, yellowish hairs, and a few similar, though shorter, hairs are scattered about the bases of the legs.

Coloration dark above, with a small patch of silvery scales on the vertex and another on the scutellum. Lateral margins of abdominal tergites, sides of thorax, venter of abdomen, and a lateral triangular area on the occiput also with silvery scales. Club of halteres with dark scales dorsally and apically and white scales ventrally. Eyes black. Proboscis dark, with light yellowish scales ventrally. Eyes black. Proboscis dark, with light yellowish scales ventrally. Legs dark-scaled, with exception of the apical portion of the second through the fourth mesotarsal segments, which are pale scaled dorsally, and all legs are pale scaled ventrally, the scales yellowish on the femora and tibiae and gradually darkening until, on the apical tarsal segments, their coloration is indistinguishable from the dorsal scales. The dark scales of the abdomen, legs and proboscis have a bluish or coppery reflection; those of the mesonotum give it a greasy appearance in reflected light; those of the pronotal lobes are violaceous. The dorsal dark scales and ventral white scales of the abdomen meet in a straight line along the sides of the abdomen.

Hypopygium (Figures D and F). Basistyle (side piece) less than twice as long as wide, clad with scales laterally and with two ventro-




*Wyeomyia haynei*, n. sp.—A. Larva, terminal segments of abdomen, lateral view; B. Larva, mentum; C. Larva, head, dorsal view; D and F. Terminal abdominal segments of holotype male, lateral and ventral views; E. Pupa, terminal segments of abdomen, dorsal and ventral half-views. G. Dististyle of holotype male, lateral view.

lateral groups of hairs; a sub-basal group of three or four and a subapical group of two. Dististyle (or clasper, Figure G) complex, greatly swollen at the middle of its length, with a dorsal hooked process, a ventral process bearing two spines, a ventral bladder-like swelling, lateral striations, a dorsal row of hairs and a mesal row of spines. Apex snout-like, with two acute subapical spines ventrally. Ninth tergite with 4 pairs of spines. (The terms "dorsal" and "ventral" as here used are not anatomically correct, but are relative to the position of the remainder of the body.)

ALLOTYPE FEMALE. Abdomen 1.33 mm. long; wing 1.93 mm. long, .38 mm. wide; proboscis 1.43 mm. long; palpus .09 mm. long. Similar to the male in all respects (coloration, vestiture, palpi, antennae) with exception of the mesotarsal claws which are small and equal in size and the female terminalia.

TABLE I. Relative lengths of legs and tarsal segments of *Wyeomyia haynei*, holotype and allotype. (Units of measurement not in mm., but the scale of the cross-hatched eyepiece of microscope.)

| | | Fe- | | —Tarsal segments— | | | | Femur | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Leg | mur | Tibia | 1 | 2 | 3 | 4 | 5 | Tibia | Tarsi | Total |
| Holotype | Front | 8.2 | 7.7 | 4. | 2.3 | 1.5 | .8 | .6 | 15.9 | 9.2 | 25.1 |
| Male | Middle | 7.8 | 6.3 | 4. | 2.9 | 1.6 | .8 | .6 | 14.1 | 9.9 | 24 |
| | Hind | 6. | 5.8 | 6.5 | 4. | 3.2 | 2.3 | 1.1 | 13.8 | 15.1 | 28.9 |
| Allotype | Front | 5.9 | 5. | 3. | 1.9 | 1.2 | .8 | .6 | 10.9 | 7.5 | 18.4 |
| Female | Middle | 5.9 | 4.3 | 3. | 2.4 | 1.3 | .7 | .6 | 10.2 | 8. | 18.2 |
| | Hind | 4.5 | 4.2 | 4.9 | 3.2 | 2.6 | 2. | .9 | 8.7 | 13.6 | 22.3 |

PUPA. Previously described by Mitchell. The terminal segments of the abdomen are shown in Figure E. Hair A is very large and multifid on segments 7 and 8 and, as in *Culex*, is situated ventrally on segment 8. Apex of paddle subtruncate, with numerous fine hairs; the usual one or two "paddle hairs" are not differentiated.

FOURTH INSTAR LARVA (Figures A, B and C). Head rounded, about as wide as long; head hairs simple, fine, situated anteriorly on the fronto-clypeal sclerite; antennae small, slender, glabrous, with a simple hair located dorsally at about the apical fourth of its length. Mentum with 8-11 teeth on each side of the median tooth, which is the largest (Figure B). Occipital foramen produced laterally to a point not far behind each eye. Dorsal submedian prothoracic hair groups of fine hairs, not arising from a platelet, the two groups widely separated. Thorax and abdomen laterally with long hairs. Comb a single row of 11 to 28 scales, each scale elongate, with a relatively long apical free portion; apex blunt, with sparse spinules. Air tube about four times longer than its diameter, with paired dorso-lateral and ventro-lateral rows of hairs, each row of 5-7, usually 6 hairs; acus and dorsal pre-apical spine absent; spiracular valves with a pair of strong, curved setae dorsally. Anal segment about as long as wide, with dorsal saddle extending to about the middle of the

sides; caudal and lateral hairs of anal segment elongate, usually bifid; ventro-lateral hair shorter, usually bifid; ventral brush absent. Anal gills two pair; the lower pair longer than the anal segment, the upper pair approximately a third as long as the lower.

TABLE II. A comparison of the number of comb scales in all larval instars of *Wyeomyia haynei* and *Wyeomyia smithii*.

| Species | Instar | Number of combs examined | Number of comb scales: Maximum | Minimum | Average |
|---|---|---|---|---|---|
| haynei | 1 | 8 | 10 | 6 | 8 |
| smithii | 1 | 4 | 12 | 9 | 10.5 |
| haynei | 2 | 8 | 13 | 10 | 10.9 |
| smithii | 2 | 4 | 10 | 9 | 9.5 |
| haynei | 3 | 24 | 19 | 10 | 15.4 |
| smithii | 3 | 38 | 19 | 7 | 10.8 |
| haynei | 4 | 40 | 28 | 11 | 18.0 |
| smithii | 4 | 32 | 16 | 4 | 8.9 |

THIRD AND SECOND INSTAR LARVAE. The description of the fourth instar applies equally well to these instars, except for the smaller size of the larvae and reduced number of branches of certain hairs.

FIRST INSTAR LARVAE. Gills as described for fourth instar larvae; ventro-lateral hair of anal segment present; air tube with a single pair of ventro-lateral hairs followed by two pairs of spines.

EGG. Length .42 mm., diameter .15 mm.; color dark grey, without evident surface sculpture, flattened on under side, ends bluntly rounded.

Holotype, allotype and 12 paratypes are labelled "Columbia, S. C., April 1945, O. L. Cartwright, collector." Many paratypes were reared by the writer from larvae collected January 12, 1946. All instars of larvae and eggs were collected by Captain Roy F. Fritz, July 12, 1945.

The type locality is in Lexington County, 8.2 miles S.W. of Columbia, South Carolina, near the Watling Road, between the Columbia Air Base and U. S. Highway No. 1. A small bed of sphagnum moss and pitcher plants, not more than ten feet in diameter, occurs near the rim of a valley in sandy country overgrown with scrub oak. The soil is very porous, and it is likely that an outcropping of impervious substratum at this point has enabled this bog plant association to exist. This site was discovered by Frank T. Arnold, Jr., of the South Carolina State Board of Health.

The holotype and allotype are deposited in the U. S. National Museum. Paratypes are deposited in the Communicable Disease Center headquarters office, Atlanta, Georgia, the South Carolina State Board of Health, and the author's collection.

The exact range of *haynei* cannot be determined until further collections are made. Its host plant is the southern subspecies, *Sarracenia purpurea venosa* Raf. Both *venosa* and the northern subspecies, *gibbosa* Raf. are said to occur in southern New Jersey (3), and it would be interesting to learn if both species of *Wyeomyia* occur in that region, and if they will interbreed, or if there are integradations in nature. The writer has collected *Wyeomyia* larvae at Theodore, Alabama, where Dr. F. M. Jones collected "*smithii*" in 1910, and finds that here the upper pair of anal gills are only slightly shorter than the lower; the larvae and adults are otherwise indistinguishable from *haynei*. The host plant in this region has pale pink flowers, and is designated as horticultural variety Louis Burk (3).

The larval characters which distinguish *haynei* from *smithii* are the presence of a small pair of dorsal anal gills, the comb scales more numerous (see table II) and mesothoracic hair 13 equal to or smaller than (not larger than) prothoracic hair 13. The hairs of the anal segment are usually bifid in *haynei*, usually trifid in *smithii*. In the adult the presence of a patch of silvery scales on the scutellum distinguishes *haynei* from *smithii*, in which the said scales are dark.

*Wyeomyia haynei* is named in honor of Dr. Theodore Brevard Hayne, of South Carolina, who died of yellow fever in July 1930, at the age of 31, while working with the Rockefeller Foundation at Lagos, West Africa.

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3. Wherry, E. T. 1933. The Geographical Relations of *Sarracenia purpurea*. Bartonia, No. 15, pp. 1-6, pl. I.

## ERRATUM

The following correction is necessary in Volume 48(9) :237, 1946, last four lines before the footnotes:

The reared adults were determined as *Aedes mathesoni* and were numbered to correspond with the cast larval skins. The Georgia specimens were isolated, reared and the cast larval skins numbered to correspond with respective emerged adult specimens by Lt. Robert M. Russel at Camp Gordon.